

1 **CLAIMS**

2 I (We) claim:

3 1. A compression screw assembly for delivery of an ortho-biological material
4 to a fracture site comprising a lag screw and a compression screw, said lag screw
5 having an elongated body with a leading end, a distal end, and a longitudinal bore,
6 external threads on said leading end for engaging a bone proximal to a fracture site,
7 said distal end adapted to extend distally of said fracture site, a first connector on said
8 distal end, at least one discharge hole in said elongated body between said external
9 threads and said distal end, said compression screw having an enlarged head on one
10 end and a second connector on the other end, said second connector on said
11 compression screw adapted to mate with said first connector whereby said
12 compression screw exerts a compressive force between said enlarged head and said
13 external threads reducing the fracture.

14
15 2. A compression screw assembly of claim 1 comprising a side plate having
16 a body with a distal surface and a proximal surface, an aperture in said plate sized to
17 accommodate said distal end of said lag screw whereby said side plate is adapted to
18 slide along said elongated body and exerts compressive force between said enlarged
19 head and said external threads.

20 3. A compression screw assembly of claim 2 comprising said distal end of said
21 elongated body shaped for non-rotational movement and said aperture shaped for
22 sliding longitudinally along said body.

1 4. A compression screw assembly of claim 2 comprising a barrel on said
2 proximal surface of said side plate surrounding said aperture.

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4 5. A compression screw assembly of claim 3 comprising a barrel on said
5 proximal surface of said side plate surrounding said aperture.

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7 6. A compression screw assembly of claim 2 comprising a cortical screw hole
8 in said side plate.

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10 7. A compression screw assembly of claim 4 comprising a cortical screw hole
11 in said side plate.

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13 8. A compression screw assembly of claim 1 comprising at least one tang exit
14 hole in said leading end, a tang body movably disposed in said through bore, at least
15 one tang leg mounted on said tang body, said tang leg adapted to translate through
16 said tang exit hole upon movement of said tang body.

17
18 9. A compression screw assembly of claim 2 comprising at least one tang exit
19 hole in said leading end, a tang body movably disposed in said through bore, at least
20 one tang leg mounted on said tang body, said tang leg adapted to translate through
21 said tang exit hole upon movement of said tang body.

1 10. A compression screw assembly of claim 9 comprising said tang leg
2 extending from one end of said tang body and internal screw threads in the other end
3 of said tang body, said screw threads adapted to seal said tang body.
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5 11. A compression screw assembly of claim 1 comprising an elongated
6 adapter, said adapter being of a size to telescope within said bore of said elongated
7 body, said adapter having a second bore extending from one end and terminating in
8 a fluid exit port near the other end, said one end adapted to be connected with a
9 syringe and said fluid exit port adapted to register with said discharge hole in said
10 elongated body whereby ortho-biological material may be delivered to a fracture site.
11

12 12. A compression screw assembly of claim 10 comprising an elongated
13 adapter, said adapter being of a size to telescope within said through bore of said
14 elongated body, said adapter having a bore extending from one end and terminating
15 in a fluid exit port near the other end, said other end beyond said fluid exit port having
16 external screw threads adapted to engage said internal screw threads in said tang
17 body, said one end adapted to be connected with a syringe and said fluid exit port
18 adapted to register with said discharge hole in said elongated body whereby ortho-
19 biological material may be delivered to a fracture site.
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1 13. A compression screw assembly kit for delivery of an ortho-biological
2 material to a fracture site comprising a lag screw, a compression screw, a side plate,
3 and an adapter, said lag screw having external threads on one end adapted to fix said
4 lag screw in a bone proximal to a fracture site, a bore extending from said one end to
5 the other end, said bore having internal threads in said other end, a circumferential
6 seal in said bore spaced distally from said external threads, a discharge hole in said
7 bore between said external threads and said shoulder, said side plate having an
8 aperture adapted to telescope with said other end of said lag screw, said adapter
9 having one end, a connector on the other end and a bore from said connector
10 terminating in a fluid exit port near said one end, said adapter having a circumferential
11 shoulder between said fluid exit port and said connector, said compression screw
12 having an enlarged head on one end and external threads on the other end, said
13 connector sized to pass through said aperture of said side plate and engage said
14 internal threads in said through bore of said lag screw, said head adapted to engage
15 said body of said side plate, whereby said lag screw may be threadably fixed in a bone
16 proximal to a fracture site, said adapter is insertable into said said lag screw with said
17 shoulder engagable with said seal and said fluid exit port registered with said
18 discharge hole, said connector adapted to mate with a source of ortho-biological
19 material for permitting said ortho-biological material to flow through said adapter and
20 out the discharge hole in the vicinity of said fracture site, said adapter being
21 removable, said side plate adapted to be telescoped with said lag screw and said
22 compression screw being insertable through said aperture for threadable engagement

1 with said internal threads to apply compressive force between said side plate and said
2 lag screw to reduce said fracture.

3
4 14. A compression screw assembly kit of claim 13 comprising at least one
5 tang exit hole in said one end of said lag screw, a movable tang body in said bore
6 between said discharge hole and said external threads, said tang body having at least
7 one tang leg on one end and a seal on the other end, said one end of said adapter
8 sized to engage said seal on said tang body whereby upon insertion of said adapter
9 into said lag screw, said one end of said adapter engages said seal in said tang body
10 and said tang body is moved in said bore to register said fluid exit port and said
11 discharge hole thereby extending said tang leg from said tang exit hole.

12
13 15. A compression screw assembly kit of claim 14 comprising said seal in said
14 tang body being threads, said one end of said adapter having threads whereby
15 threadably engaging said adapter threads and said tang body threads forms a seal.

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17 16. A compression screw assembly for reduction of a fracture comprising a
18 lag screw and a compression screw, said lag screw having an elongated body with a
19 leading end, a distal end, and a longitudinal bore, external threads on said leading end
20 for engaging a bone proximal to a fracture site, a tang body movably mounted in said
21 longitudinal bore, said tang body having at least one tang leg, at least one tang exit
22 hole formed in said leading end communicating with said longitudinal bore, said tang

1 leg adapted to extend through said tang exit hole as said tang body moves toward
2 said leading end, said distal end adjustably connected to one end of a compression
3 screw having an enlarged head on the other end, said compression screw adapted
4 to adjust the interval between said external threads and said enlarged head whereby
5 said compression screw exerts a compressive force between said enlarged head and
6 said external threads reducing the fracture.

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8 17. A compression screw assembly of claim 16 comprising an end cap
9 mounted in said leading end of said longitudinal bore.

10
11 18. A compression screw assembly of claim 16 comprising an adapter sized
12 to telescope through said bore and engage said tang body whereby said tang body
13 is moved toward said leading end and extending said tang leg through said tang exit
14 hole.

15
16 19. A method of treating fractures comprising the steps of:
17 (a) providing a cannulated lag screw having a leading end with external threads and
18 a discharge hole, a compression screw for engaging the trailing end of said lag screw,
19 a tubular adapter sized to telescope through said lag screw, and an amount of ortho-
20 biological material ;
21 (b) screwing said lag screw through said fracture site to engage the bone fragment
22 proximal to said site with said trailing end distal of said site and said discharge hole

1 adjacent to said site;

2 (c)telescoping said adapter into said lag screw:

3 (d)applying said ortho-biological material through said adapter to exit through said
4 discharge hole;

5 (e) removing said adapter from said lag screw;

6 (f) engaging said compression screw in said trailing end of said lag screw and
7 reducing the interval between said external threads and said compression screw
8 thereby reducing said fracture.

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10 20. A method of treating fractures of claim 19 comprising the steps of:

11 (a) providing a tang body having a tang leg in said cannulated lag screw and tang exit
12 holes in said leading end;

13 (b) telescoping said adapter into said lag screw and contacting said tang body; and

14 (c) translating said tang body toward said leading end and extending said tang leg
15 through said tang exit hole.